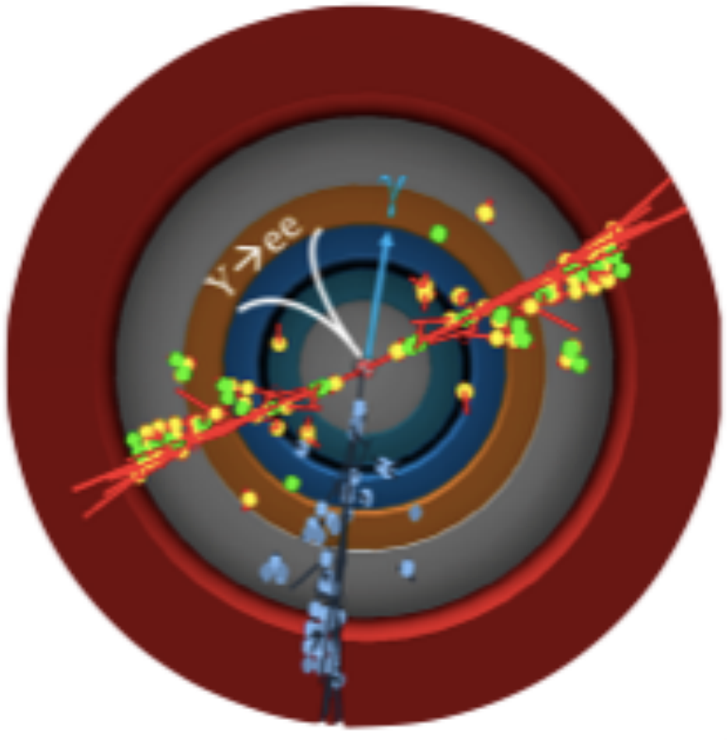


sPHENIX response to ALD re-scoping charge

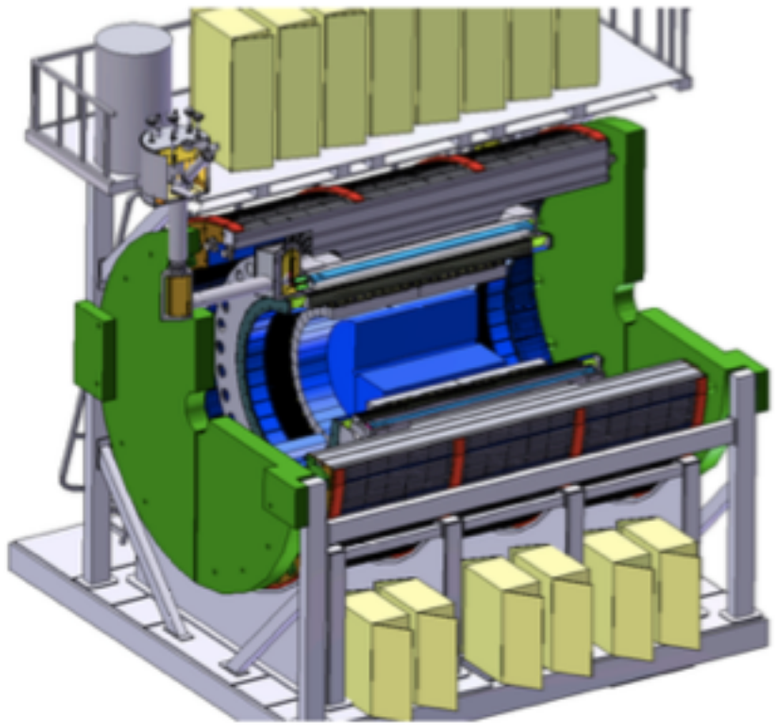
Dave Morrison
Gunther Roland

sPHENIX fortnightly general meeting 6/3/2016

Document

Please download current draft from:

https://www.dropbox.com/s/7uozkj5wggmmv5g/draft_v1_v2_diff.pdf?dl=0



Answering the Baseline Scope Charge

The sPHENIX Collaboration
May 31, 2016

Great effort by the collaboration!

but we're not quite done yet…

sPHENIX fortnightly general meeting 6/3/2016

General approach

- Interpret charge as saving **~$4M out of ~$18M "discretionary" M&S budget**, while optimizing capabilities for compelling physics
- Science drivers/case studies
    - **Jet structure and substructure**
    - **Heavy flavor jets**
    - **Upsilon spectroscopy**
- Identified comprehensive list of re-scoping options for each subdetector
- For each option, identified
    - **Cost savings**
    - **Project concerns**
    - **Feasibility of later buy-back**
    - **Physics impact**
- Concise main text, long appendices format suggested by ALD
- **ALD advised not to present single configuration for up/down vote**
    - Show examples on how to combine options
    - Follow-up is still undefined: Document will be discussed with PMG, but unclear what comes next (except that there will be more reviews)

Where do we stand?

- Received input from project and L2 managers on cost savings, engineering and schedule impact

- GEANT based evaluation of jet response, fragmentation bias, tracking performance, Upsilon resolution
  - heroic effort by tracking group

- Produced several drafts; discussion with EC/ToGs++

- Some important issues remain

Key points

- "no confidence vote" for VTX pixels - strongly emphasize need for MAPS inner tracker
  - did not manage to repeat b-tagging studies
  - will hopefully obtain further DCA performance plots tomorrow
  - **Should we include an example config with a single MAPS layer?**

- Only discuss TPC outer tracker option
  - Other options either unrealistically expensive (full MAPS)or lack simulation based performance evidence (Drift chambers)
  - Last chance to change course at tracking review
  - **TPC data recording challenge not addressed**

- Major savings come from EMCal
  - Jet response studies show that combining reduced eta EMCal and HCal modifications lead to unacceptable jet performance
  - Essentially eliminates thin oHCal and no iHCal options
  - **Shortened oHCal possible, but engineering changes interfere with future forward and EIC plans**

Discussion

- Which, if any, example configurations should we include?
- What do we say about TPC data storage?
- How strongly do we emphasize interference with EIC plans?
- Do we ask for delay until Monday to include 2-layer MAPS and VTX pixel simulations?
  - Last chance for proof-reading

from Jamie

Scenarios

Changes	Δ
MAPS (2 layers)	+3.0
No VTX	- 0.2
EMCal gran.	- 1.7
EMCal red. Acc.	-2.0
Daq/Trig to off	-0.9
No Beam Count.	-0.6
Total	-2.4

Neg.
Worse e/pi, accept for Ups./photons
Pos. includes good tracking, B-tag pot.
Buy back path to full detector
Slower reconstruction

Changes	Δ
MAPS (1 layers)	+2.2
No VTX	- 0.2
EMCal gran.	- 1.7
EMCal red. Acc.	-2.0 ** even more
Daq/Trig to off	-0.9
No Beam Count.	-0.6
Total	-3.2 (get close to $4M)

Neg. Worse e/pi, accept for Ups./photons
Good tracking, no B-tag pot.
Buy back path to full detector
Slower reconstruction